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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,271	09/30/2003	Akiko Toriyama	SON-2863/CIP	2075
23353	7590	10/04/2005	EXAMINER	
RADER FISHMAN & GRAUER PLLC LION BUILDING 1233 20TH STREET N.W., SUITE 501 WASHINGTON, DC 20036			NGUYEN, THANH NHAN P	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 10/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/673,271

Applicant(s)

TORIYAMA ET AL.

Examiner

(Nancy) Thanh-Nhan P. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3, 5 and 7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5 and 7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to Amendment dated 7/19/2005.
2. Claims 1, 3, 5 and 7 are presented for examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitahora et al U.S. Patent Application Publication No. 2002/0039167 in view of Tanaka et al U.S. Patent Application Publication No. 2003/0151710.

Referring to claims 1 and 3, Kitahora et al discloses a liquid crystal display element configured by holding a liquid crystal layer (6) between a pair of substrates (1 & 2) arranged to face to each other, [see fig. 1], wherein a twisted nematic type liquid crystal material, [see Abstract – mixture of chiral material and nematic liquid crystal], used in said liquid crystal layer having the dielectric constant anisotropy $\Delta\epsilon$ in a range of 5 to 50; the cell gap d indicating a distance between the substrates of liquid crystal element in the range of 3 to 8 μm , [see Abstract], and the refractive index anisotropy Δn in the range of 0.15 to 0.23, [see par. 0073].

Even though Kitahora et al does not disclose the dielectric constant anisotropy $\Delta\epsilon$ in the range of 0 to 8; the cell gap d indicating a distance between the substrates of

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liquid crystal element in the range of 2 to 3 μm ; and the refractive index anisotropy Δn in the range of 0.16 to 0.18, it has been judicially determined that overlapping ranges are at least obvious, [see MPEP 2144.05]. And the ranges, such as $\Delta\epsilon$ in the range of 0 to 8; d in the range of 2 to 3 μm ; and Δn in the range of 0.15 to 0.23 would have been obvious to one of ordinary skill in the art. Further, it would have been obvious to select such those values in the twisted nematic liquid crystal display for the benefit of driving with low voltage, and being capable of obtaining a great light reflectance and a high contrast, [see par. 0012].

Kitahora et al lacks disclosure of the twist elasticity modulus $K_{22} > 6.0$ pN.

Tanaka et al discloses the twist elasticity modulus K_{22} preferably in the range of 5 to 10 pN, which overlapping range of $K_{22} > 6$ pN. It has been judicially determined that overlapping ranges are at least obvious, [see MPEP 2144.05], and the range of $K_{22} > 6$ pN would have been obvious to one of ordinary skill in the art. Further it would have been obvious to select such that value in the twisted nematic liquid crystal display for the benefit of being possible to achieve a sufficiently high speed splay-band transition, [see par. 0163].

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitahora et al in view of Tanaka et al as discussed above, and further in view of Nishimura U.S. Patent Application Publication No. 2002/0054266.

Referring to claim 5, Kitahora et al lacks disclosure of a range of a pixel size of a pixel of liquid crystal display element is 18 μm or less. Nishimura discloses the pixel size

is approximately 12 μm , [see par. 0004], for the benefit of making "microdisplay" for being used for viewfinders in digital cameras and camcorders, in projection monitors; or fixed to a frame, such as eyeglasses, thereby giving a user a virtual image of a virtual computer screen which is very light weight and also very private, [see pars. 0007, 0008]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have a pixel size of a pixel of liquid crystal display element is 18 μm or less for the benefit of making "microdisplay".

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa et al U.S. Patent No. 6,356,332 in view of Kitahora et al, and further in view of Tanaka et al.

Referring to claim 7, Ichikawa et al discloses a projection type display device comprising a light source (371); a light convergence optical system (372) for guiding a light emitted from light source to a liquid crystal display element; a projection optical system (380) for enlarging and projecting a light subjected to light modulation by liquid crystal display element, [see fig. 16], wherein liquid crystal display element is configured by holding a liquid crystal layer between a pair of substrates arranged to face to each other, [see fig. 4].

Ichikawa et al lacks disclosure of the liquid crystal layer used is a twisted nematic type liquid crystal material having the dielectric constant anisotropy $\Delta\epsilon$ in the range of 0 to 8; the cell gap d indicating a distance between the substrates of liquid crystal element

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in the range of 2 to 3 μm ; and the refractive index anisotropy Δn in the range of 0.16 to 0.18.

Kitahora et al discloses a liquid crystal display element configured by holding a liquid crystal layer (6) between a pair of substrates (1 & 2) arranged to face to each other, [see fig. 1], wherein a twisted nematic type liquid crystal material, [see Abstract – mixture of chiral material and nematic liquid crystal], used in said liquid crystal layer having the dielectric constant anisotropy $\Delta\epsilon$ in a range of 5 to 50; the cell gap d indicating a distance between the substrates of liquid crystal element in the range of 3 to 8 μm , [see Abstract], and the refractive index anisotropy Δn in the range of 0.15 to 0.23, [see par. 0073].

Even though Kitahora et al does not disclose the dielectric constant anisotropy $\Delta\epsilon$ in the range of 0 to 8; the cell gap d indicating a distance between the substrates of liquid crystal element in the range of 2 to 3 μm ; and the refractive index anisotropy Δn in the range of 0.16 to 0.18, it has been judicially determined that overlapping ranges are at least obvious, [see MPEP 2144.05]. And the ranges, such as $\Delta\epsilon$ in the range of 0 to 8; d in the range of 2 to 3 μm ; and Δn in the range of 0.15 to 0.23 would have been obvious to one of ordinary skill in the art. Further, it would have been obvious to select such those values in the twisted nematic liquid crystal display for the benefit of driving with low voltage, and being capable of obtaining a great light reflectance and a high contrast, [see par. 0012].

Ichikawa et al further lacks disclosure of the twist elasticity modulus $K_{22} > 6.0$ pN.

Tanaka et al discloses the twist elasticity modulus K_{22} preferably in the range of 5 to 10 pN, which overlapping range of $K_{22} > 6$ pN. It has been judicially determined that overlapping ranges are at least obvious, [see MPEP 2144.05], and the range of $K_{22} > 6$ pN would have been obvious to one of ordinary skill in the art. Further it would have been obvious to select such that value in the twisted nematic liquid crystal display for the benefit of being possible to achieve a sufficiently high speed splay-band transition, [see par. 0163].

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Kitahora et al U.S. Patent Application Publication No. 2002/0039167.

Tanaka et al U.S. Patent Application Publication No. 2003/0151710.

Nishimura U.S. Patent Application Publication No. 2002/0054266.

Ichikawa et al U.S. Patent No. 6,356,332.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to (Nancy) Thanh-Nhan P. Nguyen whose telephone number is 571-272-1673. The examiner can normally be reached on M-F/9-5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

(Nancy) Thanh-Nhan P Nguyen
Examiner
Art Unit 2871
-- September 30, 2005 --

TN

Andrew Schechter
ANDREW SCHECHTER
PRIMARY EXAMINER